Disability in chronic low back pain

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GENERAL DISCUSSION AND CONCLUSION

CHAPTER 9

GENERAL DISCUSSION

This thesis focused on the psychometric properties of both ADL- and work-related instruments for the assessment of limitations in patients with chronic low back pain (CLBP) in the area of Rehabilitation Medicine (table 1). In this general discussion, the main findings and the clinical implications of the research will be reviewed, and directions for further research about the different topics will be given. Finally, recommendations for the utility of the instruments in rehabilitation practice in CLBP patients will be given.

In the first part of the thesis, the psychometric properties of the ADL-related instrument, the Dutch language version of the Roland Morris Disability Questionnaire (RMDQ-Dv) were studied. The RMDQ-Dv proved to be reliable and responsive independent of the external criterion used (chapter 2 and 3). The stability of the RMDQ-Dv was studied also (chapter 2). Because the results showed a substantial natural variation of 6 points on a 0-24 points scale, it is important to take into account this variation when interpreting the results clinically. It is recommended to use a change of 6 points as a clinical important change on the RMDQ-Dv in daily practice.
In general, self-reports are used in rehabilitation practice to assess ADL-related limitations. Self-reports assess patient's perception about limitations in daily functioning. Rehabilitation treatments are aimed at reducing limitations and to optimize patient's participation in society. The perception of the patient about reduction of limitations and improvement of daily functioning is an important indicator to measure treatment effectiveness.
Strictly, the RMDQ is not useful in patients with a baseline value below the 6 points or in patients with minor changes; in patients with a baseline value below the 6 points no change of 6 points or more can be measured and therefore a clinically important change can not be measured in these patients. A more specific instrument, like the Patient Specific Questionnaire (PSQ),[1,2] might be a solution in the evaluation of treatment effectiveness in these patients. In the PSQ, only those activities which are limited in the specific patients are used to evaluate effectiveness of treatment. The PSQ proved to be responsive.[1,3] The reliability and validity has not been investigated yet.
A more sensitive instrument might be a solution to detect minor changes in CLBP patients. The items of the RMDQ have a dichotomous response (yes, no). If a minor change occurs, it may be difficult to the patient to choose between these two answers. More response categories (ordinal or interval level) will enlarge the sensitivity of an instrument.[1,2] The Quebec Back Pain Disability Questionnaire (QBPDQ) for example, which uses a 6-points ordinal scale, may be a more useful instrument. Both the English and Dutch language version of the QBPDQ proved to be reliable, valid and responsive.[4,5] Looking back, it might have been a better choice to use the QBPDQ instead of the RMDQ in this thesis.

Prior to the study, we selected the RMDQ, because it was the most frequently used questionnaire in rehabilitation practice in the Netherlands and the psychometric properties studied showed good results at that time.

In the second part of this thesis the reliability of work-related instruments was studied. Different types of instruments were used: self-report, clinical examination and functional testing. The Functional Ability List (FAL) was used both as a self-report and a clinical examination instrument. The self-reports in this thesis, the Work and Handicap Questionnaire (WHQ) and the FAL, proved to be unreliable for most items (chapter 4). An interesting finding was the difference in reliability of the work and ADL part. The reliability of the work part was lower than the reliability of the ADL part. In daily practice, these results may be of great interest. For many years, the functional status has been determined by assessing the ability of a patient to perform relevant activities in daily living. Several questionnaires have been developed, such as the RMDQ and the QBPDQ, to assess the functional status, showing good reliability.[4-7] No distinction between areas of function was made. With the WHQ, patients were asked to score whether they were limited at home and then whether they were limited at work. A similar scale and lay-out was used, nevertheless large differences were found between both domains. It can be hypothesized that for patients it is difficult to give reliable information about work-related items on this questionnaire. The unacceptable reliability of the FAL (chapter 4) confirmed the findings that work limitations might not be assessed reliably by self-reports. Future research is needed to investigate why patients are less able to score reliably work limitations and how reliability of work-related self-reports could be improved.

Table 1. Instruments used in this thesis

Instruments	Type	Area of function	Content	Level of analysis	Scale
Roland Morris Disability Questionnaire (RMDQ)	Self-report	ADL	24 activities	Sum score	Dichotomous
Work & Handicap Questionnaire (WHQ)	Self-report	ADL Work	22 ADL activities 26 work-related activities	Item and sum score	Dichotomous
Functional Information System (FIS)	Clinical examination	Work	15 activities	Item	Ordinal
Functional Ability List (FAL)	Self-report Clinical examination	Work	22 activities	Item	Ordinal
Isernhagen Work Systems Functional Capacity Evaluation (IWS FCE)	Functional testing	Work	28 activities	Item	Dichotomous Interval

History and clinical examination results were the basis for filling out the Functional Information System (FIS) and the FAL. The results on both forms proved to be unreliable, despite standardisation of proceedings prior to the study (chapter 5). In CLBP, clinical examination relies mainly on self-reports, because minor clinical findings will be found in the absence of pathoanatomical conditions underlying back symptoms in CLBP patients. Thus, self-reports will have a great impact on history taking and clinical examination. As described before, the work-related self-reports in this thesis proved to be unreliable. It can be argued that it is impossible for the physician to provide reliable assessment results, if the assessment relies mainly on the unreliable reported information of the patient about work limitations.
The WHQ, FIS and FAL were developed and used in Occupational Research and Social Insurance Medicine. Whether the research results of this thesis can be applied to these disciplines is unclear. However, the poor reliability results on the WHQ, FAL and FIS in this thesis should at least stimulate these disciplines to investigate the reliability of the instruments.

The functional testing instrument was based on the Isernhagen Work Systems Functional Capacity Evaluation (IWS FCE). A large part of the tests has an acceptable reliability (79% based on Kappa values, 61% based on ICC values) (chapter 6). The stability of the IWS FCE tests was studied also. Substantial natural variation was found especially in the material handling tests. Just as for the RMDQ only treatment effects exceeding the natural variation can be regarded as "real change". Research is necessary to study the causes of the large amount of natural variation, to analyze the sources of variation, and to achieve more stability in the IWS FCE results. When comparing indices of variation in CLBP patients and in healthy subjects (chapter 7), it was seen that a part of the variation can be attributed to CLBP patients. The remaining variation due to the testing protocol or to the evaluator should be investigated also.
Basically, the IWS FCE is a heterogeneous set of tests including different scales (dichotomous and interval) and different end-points of testing (tests without a ceiling or criterion, with a ceiling or with a criterion). This heterogeneity leads to rather complex results, which can not be interpreted simply. Furthermore, to assess effectiveness of treatment, the usefulness of the IWS FCE is debatable. No changes exceeding the natural variation will be expected. Especially those tests with ceiling and criterion effects are not useful to determine the effectiveness of treatment. In future research, changes in the testing procedure, elimination of ceiling effects and using one scoring scale (preferable interval level) should be considered to improve the ability to detect change and thus to make the IWS FCE more applicable to researchers and to practitioners. After design adjustments, reliability of the IWS FCE should be investigated again.

In chapter 8, the work limitations inferred from three perspectives (self-report, clinical examination and functional testing) were compared. Self-reported limitations were considerably larger than those derived from clinical examination or functional testing. Additionally, the limitations derived from the clinical examination were considerably larger than those derived from functional testing. The differences found between the three perspectives may be influenced by the poor reliability of the FAL, which was used as the scoring form for all three perspectives. However, the results of the study confirm the results of other studies.[8-13] At the start of the comparison study the reliability of the FAL was still unknown. In future research it would be preferable, to use a reliable instrument to compare the results inferred from three perspectives to minimize the possibility of finding differences due to unreliability.

Most patients showed good performances on the IWS FCE tests, however CLBP caused absence of work in a substantial part of these patients. In these patients other factors may cause the limitations and restrictions in patient's daily living. As described in the International Classification of Functioning and Disability (ICF, figure 1 in chapter 1), both individual and environmental factors, like coping, psychological distress, outcome expectancy, work satisfaction, work load, social support, workers' compensation and employer's response to the claim,[14-16] may influence the level of perceived limitations and restrictions in CLBP patients in daily living. The influence of these factors on the performance will be subjected to the environment of testing. The IWS FCE assesses limitations in performance in a laboratory setting. One can argue that the results of the assessment will be different if the patient is assessed in a work situation and that the performance assessed in the laboratory setting may be weakly related to the performance at work. Furthermore, the maximal performance which is assessed in the IWS FCE will not predict the performance during a working day. Although in the manual of the IWS FCE an extrapolation procedure of maximal performance to an 8-hour working day is given, future research is needed to investigate the value of this procedure in the prediction of performance during a working day based on the IWS FCE results.

Considering all the instruments analyzed in this thesis it can be seen that all instruments have strengths and weaknesses. In the evaluation and treatment of CLBP patients, the rehabilitation specialists need to establish the relevant limitations to determine need for intervention, to design and plan treatment and to document treatment effectiveness. Because a gold standard does not exist, the use of one perspective assessment may lead to inadequate decisions because of the differences in limitations as a result of different perspectives. Therefore, it is recommended to use a combination of perspective assessments in order to obtain a comprehensive picture of the patient's limitations in clinical practice. The RMDQ-Dv is a useful instrument to assess patients' self-reports about ADL

limitations and to assess treatment effectiveness concerning the ADL-situation. A weakness of the RMDQ-Dv is the large amount of natural variation. In patients with low baseline values or patients with minor changes a questionnaire with more response categories (such as the QBPDQ) may be a more useful instrument. Because the RMDQ is an ADL-related instrument, it is not useful in the assessment of work limitations. Therefore, other self-report instruments are needed to assess the work limitations. Unfortunately, the self-reported instruments studied in this thesis (WHQ and FAL) were not reliable and therefore not useful in Rehabilitation Medicine. Because of the lack of existing work limitation questionnaires in general, it is recommended to improve the properties of the currently used questionnaires or to develop a new questionnaire and to investigate its psychometric properties before using it in practice.
To use the FIS and FAL as standardised forms in history and clinical examination is unacceptable because of the unreliability and for that reason they are not useful in Rehabilitation Medicine. In general, history and clinical examination are useful because they help the physician to get a description of the relevant issues related to the impact of CLBP on patient's functioning. Interaction between patient and physician is of great importance to obtain the relevant information patients want to tell and physicians want to ask. Professional knowledge, experiences in health care with other patients and personal experiences will help the physician to gather information about the relevant issues. Future research is needed to improve the psychometric properties of the FIS and FAL or to develop a new standardised form.
The reliable tests of the IWS FCE are useful as functional testing instrument to assess patient's limitations in the performance of work-related activities in a rehabilitation test setting. Instead of questioning patients about their limitations in the performance, limitations can objectively be assessed during the actual performance of the activities. A reduction of number of tests of the IWS FCE will probably be sufficient, in which the results of some tests will give insight into the performance of the patient. It is important to use those tests which are reliable but also relevant to patient's work situation. In this thesis, self-reports showed much more limitations than functional testing results. In those patients, with reported limitations, but good performances on the IWS FCE, the IWS FCE can be useful to make patients aware of their possible own level of functioning. The usefulness of the IWS FCE as an effectiveness measure to detect change should be studied in a responsiveness study, because of its ceiling and criterion effects and the large amounts of natural variation.

To assess the limitations in work functioning, the influence of other factors besides the physical limitations assessed by the IWS FCE should be investigated as well. It can be hypothesized that in CLBP patients the assessment of limitations should occur in broader view to daily practice instead of a clinical setting, to get a more realistic assessment of patient's limitations in daily practice

and of the influence of personal and environmental factors on performance. In treatment of CLBP patients, professionals (physiatrists, company doctors, employers, social insurance doctors, psychologists) should cooperate in the establishment of the relevant limitations, the determination of need for intervention, design and planning of treatment and documenting of treatment effectiveness. One case-manager should be assigned and be responsible for the treatment process.

GENERAL CONCLUSION

In general the following conclusions can be drawn according to the mean research questions of this thesis:

- The RMDQ-Dv is a useful ADL-related instrument in CLBP patients, because it proved to be reliable and responsive. The large amount of variation and the inability to assess change in patients with a baseline value below the 6 points and in patients with minor changes should be taken into account in daily practice.
- The WHQ, FIS and FAL are not useful work-related instruments in CLPB patients, because they are not reliable.
- The reliable tests of the IWS FCE are useful in daily practice to assess limitations in the performance of work-related activities in a laboratory setting. The usefulness of the IWS FCE as an effectiveness measure to detect change should be studied in a responsiveness study, because of its ceiling and criterion effects and the large amounts of natural variation.
- Using a combination of different perspective assessments is recommended in order to obtain a comprehensive picture of the patient's work limitations in Rehabilitation Medicine.

REFERENCES

1. Beurskens AJ, de Vet HC, Köke AJ, Lindeman E, van der Heijden GJ, Regtop W, Knipschild PG. A patient-specific approach for measuring functional status in low back pain. J Manip Physiol Ther 1999;22:144-148.
2. Beurskens AJ, de Vet HC, Köke AJ, van der Heijden, Knipschild PG. Measuring the functional status of patients with low back pain. Assessment of the quality of four disease-specific questionnaires. Spine 1995;20:1017-1028.
3. Beurskens AJ, de Vet HC, Köke AJ. Responsiveness of functional status in low back pain: a comparison of different instruments. Pain 1996;65:71-76.
4. Kopec JA, Esdaile JM, Abrahamowicz M, Abenhaim L, Wood-Dauphinee S, Lamping DL, Williams JI. The Quebec back pain disability scale: Measurement properties. Spine 1995;20:341-352.
5. Schoppink L, van Tulder M, Koes B, Beurskens A, de Bie R. Reliability and Validity of the Dutch adaption of the Quebec Back Pain Disability Scale. Phys Ther 1996;76:269-275.
6. Roland M, Morris R. A study of the natural history of back pain. Part I: development of a reliable and sensitive measure of disability in low-back pain. Spine 1983;8:141-144.
7. Roland M, Fairbank J. The Roland-Morris Disability Questionnaire and the Oswestry Disability Questionnaire. Spine 2000;25:3115-3124.
8. Kuijer W, Gerrits EHJ, Reneman MF. Measuring physical performance via self-report in healthy young adults. J Occup Rehabil 2004;14:77-87.
9. Reneman MF, Jorritsma W, Schellekens JMH, Göeken LNH. Concurrent validity of questionnaire and performance based disability measurements in patients with Chronic Non-specific low back pain. J Occup Rehabil 2002;12:119-129.
10. Verbunt JA, Westerterp KR, van der Heijden GJ, Seelen HA, Vlaeyen JWS, Knottnerus JA. Physical activity in daily life in patients with chronic low back pain. Arch Phys Med Rehabil 2001;82:726-730.
11. Fordyce, WE. Back Pain in the Workplace. Management of disability in nonspecific conditions. Seattle: IASP Press, 1995.
12. Gross DP, Battie MC. Construct Validity of a Kinesiophysical Functional Capacity Evaluation Administered Within a Worker's Compensation Environment. J Occup Rehabil 2003;13:287-295.
13. Simmonds MJ, Olson SL, Jones S, Hussein T, Lee CE, Novy D, Radwan H. Psychometric characteristics and clinical usefulness of physcial performance tests in patients with low back pain. Spine 1998;23:2412-2421.

14. Loisel P, Durand P, Abenhaim L, Gosselin L, Simard R, Turcotte Esdaile JM. Management of occupational back pain: the Sherbrooke model. Results of a pilot and feasibility study. Occup Environ Med 1994;51:597-602.
15. Waddell G. The back pain revolution. London: Churchill Livingstone, 1998.
16. Watson PJ. Non-physiological determinants of physical performance in musculoskeletal pain. Vienna: IASP Press, 1999:153-157.